Space Weather Forecast

Issued on Monday, 19 June 2023 at 13:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor/Moderate R1/R2 radio blackouts throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate over the past 24 hours, with two Moderate flares. The first originated from two sunspot regions close two one another in the southeast quadrant at 18/1353 UTC. The second was observed at 19/0351 UTC from the southeast limb. There are currently nine sunspot regions on the visible disc, with a region recently transiting to the far side round the southwest limb. However, this has been replaced by a new region appearing round the limb in the southeast which may reveal more complexity as it rotates further onto the visible disc. The largest and most magnetically complex regions are in the centre southern disc, but these two regions have either remained unchanged or shown slight decay over the past 24 hours. Two other regions have shown development over the past 24 hours one in the northeast and one in the southwest. All other regions remain small and magnetically simple, with little change during the period.
A slight dimming event was observed in association with the Moderate flare at 18/1353 UTC and a Coronal Mass Ejection (CME) can be seen in coronagraph imagery from 18/1400 UTC. Another dimming event was observed in the northwest around 19/0200 UTC. Both these events are initially thought not to have produced Earth directed CMEs but analysis is ongoing.

Solar Wind / Geomagnetic Activity: The solar wind has been slow to slightly elevated, with speeds ranging between 375 and 415 km/s. The total magnetic field was weak throughout, with the important north-south component unremarkable. The net result of the above solar wind measures was Quiet to Unsettled geomagnetic activity (Kp 1-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low to Moderate with a chance of further isolated Moderate flares and a slight chance of a Strong flare.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast. Earth is now under the waning influence of a coronal hole fast speed stream, with winds soon returning to slow levels. Slight enhancements to the solar wind speed are possible towards midweek, under the influence of further coronal hole high speed streams. All things considered, geomagnetic activity is expected to be mostly Quiet with a chance of Unsettled to Active intervals on days 3 and 4 (21-22 June).

Energetic Particles / Solar Radiation: No solar radiation storms are expected, though a very Slight Chance of enhancement throughout given the current configuration of front-sided sunspot groups.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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